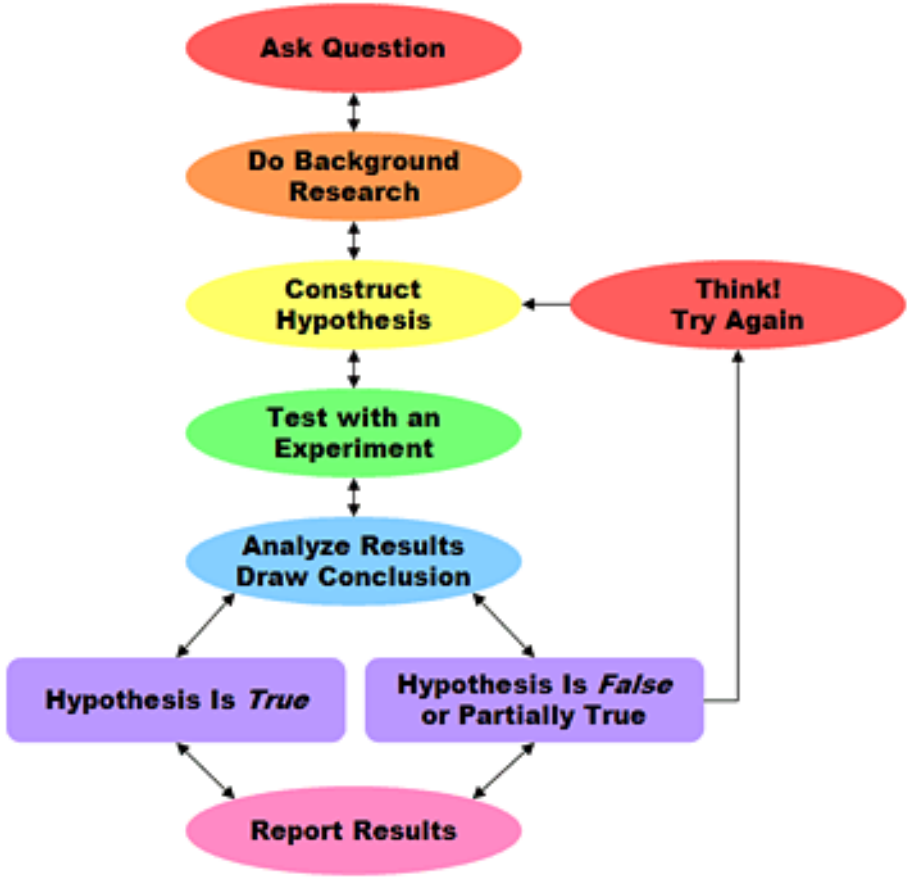
WHAT IS SCIENCE?

- The goal of science is to investigate and understand the natural world, and to use those explanations to make useful predictions.
- Science is an organized way of using evidence to learn about the natural world.
- A way of learning about the natural world through observations, asking questions, proposing answers and testing those answers!



CHARACTERISTICS OF SCIENCE

- 1. Observations lead to questions
  - Why, Where, When, What, How????
  - Testing
  - Evidence!

WHAT IS AN OBSERVATION?

- Something you can experience directly using your five senses

TOOLS OF OBSERVATION

- Microscope
- Telescope
- Chemical Indicators
- Can you think of any?

INDIRECT OBSERVATION

- Inference
  - Something you can not directly observe but can derive a tentative conclusion based on logic or reasoning

A PORTRAIT:
TAKE A MOMENT TO OBSERVE…

WHAT DO YOU SEE? WRITE IT DOWN.

HOW COME WE ARE LOOKING AT THE VERY SAME DRAWING AND SEEING TWO DIFFERENT THINGS?

HOW CAN IT BE THAT SOME OF US SEE ONLY ONE FACE AND NOT THE OTHER?

IS IT POSSIBLE THAT SOME SCIENTISTS MAY LOOK AT THE SAME PIECE OF EVIDENCE OR SET OF DATA AND SEE DIFFERENT THINGS?

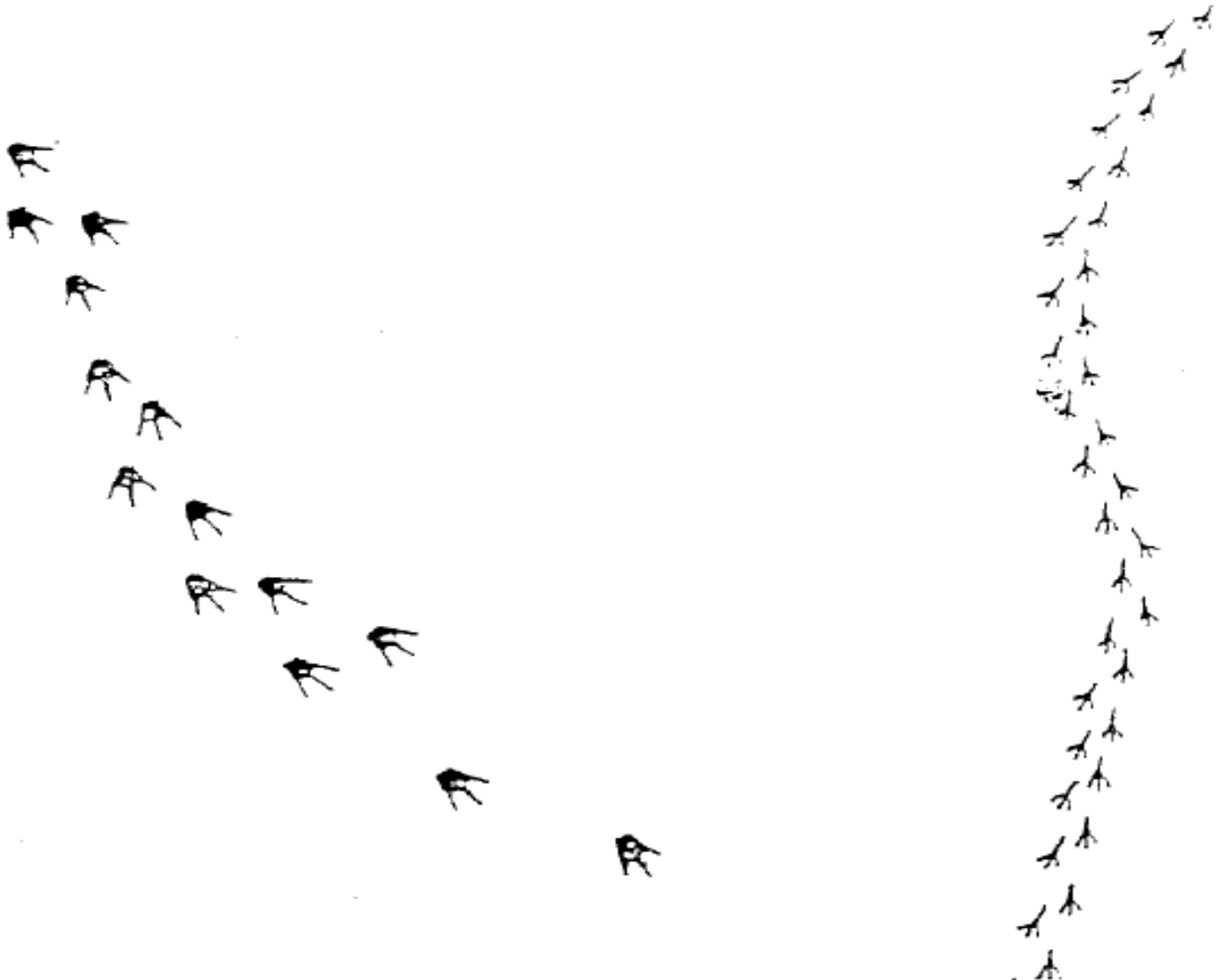
OLD LADY

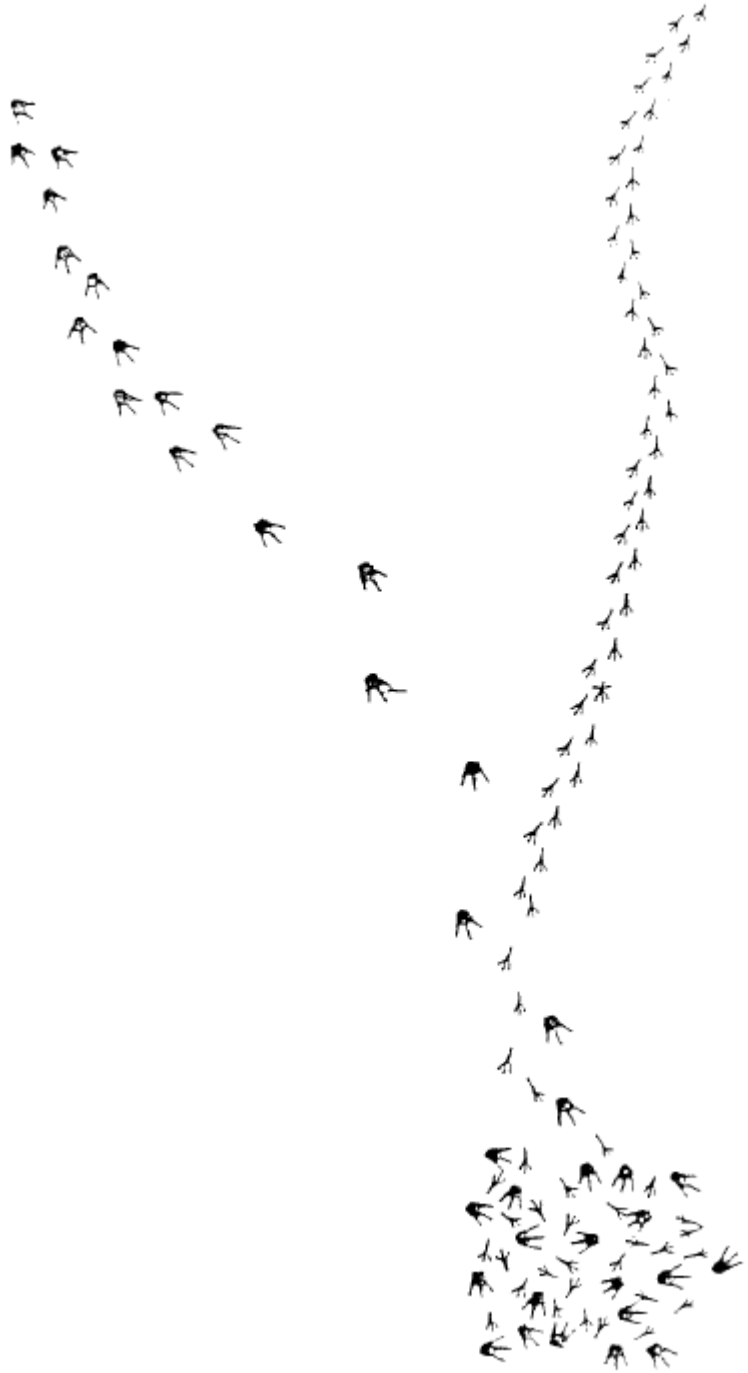
THE YOUNG LADY

How does this relate to science?

- In the same manner that you were not able to see the face of the young lady in the drawing, scientists sometimes fail to `see' a certain set of evidence as relevant to their questions.
- Scientists sometimes tend to infer different things from the same set of data in the same manner that you inferred totally different things from the same piece of evidence: *The portrait*.

INVESTIGATING TRACKS: DESCRIBE THE SCENE…



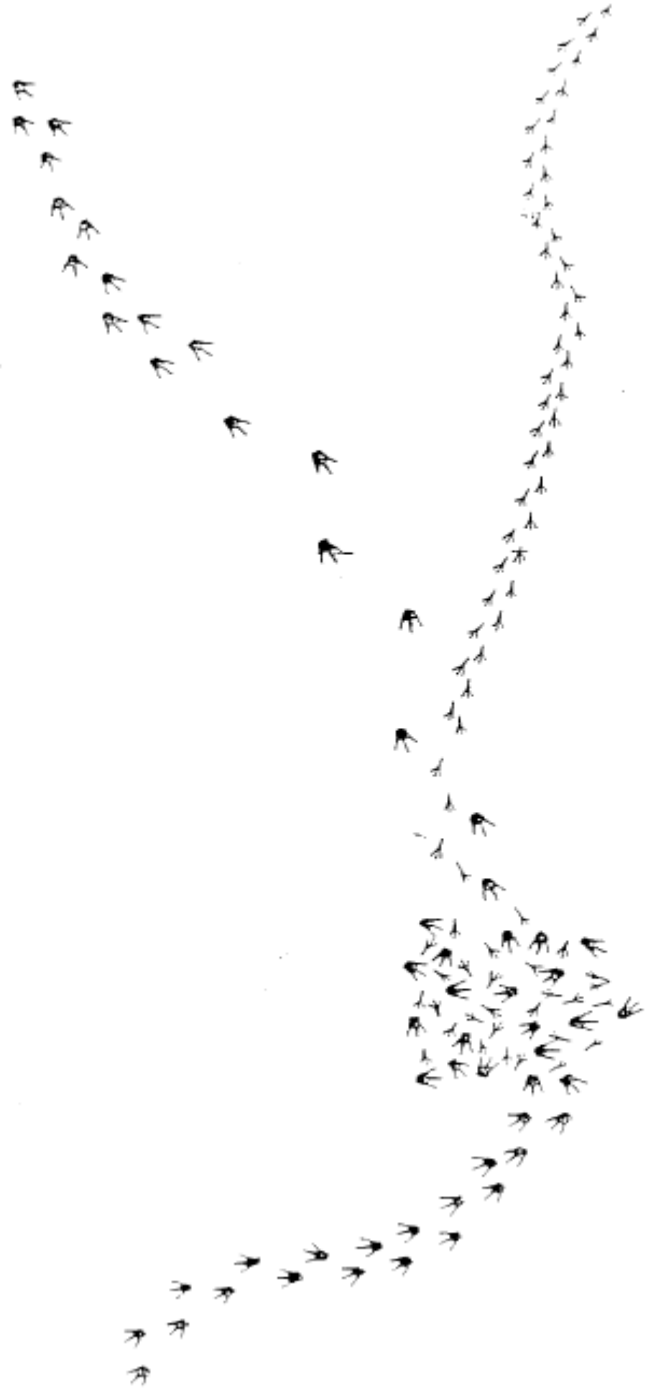


DESCRIBE THE SCENE…

OBSERVATION

OR

INFERENCE?



DESCRIBE THE SCENE…

Observation v. Inference

- Based on the same set of evidence- many equally warranted answers to the same question can be inferred.
- Scientists make similar inferences as they attempt to derive answers to questions about natural phenomena
- No single answer (or story) may solely account for that evidence...several answers are often plausible
- Scientists may simply never find the answer as to what has really happened.

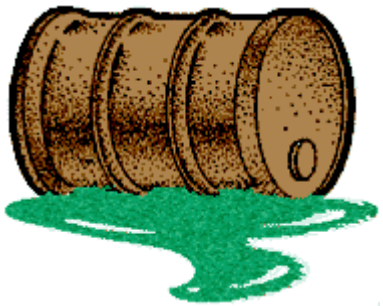
WHAT IS THIS?

When studying something describe only facts that you can see, touch, smell and hear. You are not making any guesses.

THIS IS NOT AN OPINION!!

WHAT IS THIS?

using your observations
to make a **guess** about
an object or an outcome
THIS CAN BE A SCIENTIFIC OPINION



Based on my **observations**, I **think** that this can is **old** and is leaking a **toxic** substance.